

Claims

1. A decoupled synchro-drive mobile robot base, comprising: a turret having thereon a turret motor to actuate the turret, a drive motor to actuate a wheel, and a steering motor to control a direction of movement of the wheel; a steering unit comprising a differential gear unit and transmitting an actuating force generated from the steering motor to a wheel case of a wheel unit; a drive unit comprising another differential gear unit and transmitting an actuating force generated from the drive motor to the wheel of the wheel unit; and a turret rotating unit to transmit an actuating force generated from the turret motor to the turret, wherein a part of the differential gear unit of the drive unit is coupled to the steering unit, while a part of the differential gear unit of the steering unit is coupled to the turret rotating unit, so that the drive motor, the steering motor and the turret motor are decoupled from each other.

2. The decoupled synchro-drive mobile robot base according to claim 1, wherein the steering unit comprises a first steering gear coupled to an output shaft of the steering motor; a second steering gear to engage with the first steering gear; a first differential gear unit coupled to a rotating shaft of the second steering gear; a third

steering gear provided on a first gear box of the first differential gear unit; a turret connection gear coupled to the first differential gear unit; a fourth steering gear to engage with the third steering gear; a fifth steering gear provided on a rotating shaft of the fourth steering gear; and a sixth steering gear provided on an outer surface of the wheel case to engage with the fifth steering gear.

3. The decoupled synchro-drive mobile robot base according to claim 2, wherein the first differential gear unit comprises a steering input gear coupled to the rotating shaft of the second steering gear; a steering output gear supported on the first gear box by a bearing while engaging with the steering input gear; and a turret output gear provided on a rotating shaft of the turret connection gear while engaging with the steering output gear.

4. The decoupled synchro-drive mobile robot base according to claim 1, wherein the drive unit comprises a first drive gear coupled to an output shaft of the drive motor; a second drive gear to engage with the first drive gear; a second differential gear unit coupled to a rotating shaft of the second drive gear; a third drive gear provided on a second gear box of the second differential gear unit; a steering connection gear coupled to the second

differential gear unit while engaging with a fourth steering gear; a fourth drive gear to engage with the third drive gear; a fifth drive gear provided on a rotating shaft of the fourth drive gear; and a sixth drive gear provided  
5 on an outer surface of the wheel unit to engage with the fifth drive gear.

5. The decoupled synchro-drive mobile robot base according to claim 4, wherein the second differential gear unit comprises a drive input gear coupled to the rotating  
10 shaft of the second drive gear; a drive output gear supported on the second gear box by a bearing while engaging with the drive input gear; and a steering output gear provided on a rotating shaft of the steering connection gear while engaging with the drive output gear.

15 6. The decoupled synchro-drive mobile robot base according to claim 1, wherein the turret rotating unit comprises a first turret gear provided on an output shaft of the turret motor; and a second turret gear provided on a central portion of an upper base plate while engaging with  
20 both the first turret gear and the turret connection gear.

7. The decoupled synchro-drive mobile robot base according to claim 1, wherein the wheel unit comprises an actuating bevel gear coupled to a sixth drive gear of the

drive unit and supported by a bearing on a rotating wheel shaft having wheels on both ends thereof; an actuating differential gear unit integrally operated in conjunction with the actuating bevel gear; and the wheel case, with  
5 both the actuating bevel gear and the actuating differential gear unit provided in the wheel case, the rotating wheel shaft passing through the wheel case, and a sixth steering gear of the steering unit integrated with the wheel case.

10 8. The decoupled synchro-drive mobile robot base according to claim 2 or 3, wherein a gear ratio between the fifth steering gear and the sixth steering gear is equal to that of the fifth drive gear and the sixth drive gear.

9. The decoupled synchro-drive mobile robot base  
15 according to any one of claims 2, 4 and 6, wherein, on the supposition that the number of teeth of the first turret gear/the number of teeth of the turret connection gear is designated as  $n_1$ , the number of teeth of the third steering gear/the number of teeth of fourth the steering gear is  
20 designated as  $n_2$ , the number of teeth of the fourth steering gear/the number of teeth of the steering connection gear is designated as  $n_3$ , and the number of teeth of the third drive gear/the number of teeth of the fourth drive gear is designated as  $n_4$ , each gear ratio is set as  $n_1 n_2 = 2$ , and

$n_3 n_4 = 2$ , so that the drive motor, the steering motor and the turret motor are decoupled from each other.